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of Mississippi, speak a dialect of the same Dakotan stock. Some of their remnants I met in November, 1886, on Indian Creek, near Lecompte, La.

*Maskóki*.—This family is the largest of all represented upon the map, and from the sixteenth to the eighteenth century extended even east of the Savannah River (Yámassi tribe). The Yuchi were surrounded on all sides by the Maskóki tribes, and one of these, the Seminoles, settled in Florida in the former domain of the Timucua, and west of it, where formerly the Apalaches lived. The upper and lower Creeks held the central parts of the area; and the Cha'hta, in three subdivisions, the western parts. The Biloxi, on the coast, belong to the Dakota stock. The majority of the Maskóki tribes now live in the eastern parts of the Indian Territory, within the area marked with red lines in the north-western corner of the map.

*Taensa*.—The historic Taensa people were settled at two places. From their earlier settlements on the Mississippi River, west side, between Vicksburg and Natchez City, they removed to Mobile Bay, threatened by an attack from the Chickasaw Indians, early in the eighteenth century. In 1762 they went to Louisiana with the Alibamus, and are mentioned there, on Bayou Boeuf, as late as 1812, by the Rev. Mr. Schermerhorn (*Mass. hist. coll.*).

*Nakche*.—This family were the leading people in the confederacy of Theloël, on St. Catherine Creek, near Natchez City, Miss. Since the war of 1730 they have lived scattered in various countries.

*Tonika*, or, as they call themselves, *Túnixka*, a people once residing at different places near the lower Mississippi River: 1°, on the lower Yazoo River; 2°, on the east shore of the Mississippi River, near the Red River junction; 3°, in Avoyelles parish, south of the lower Red River, Louisiana. I studied this vocalic language, new to science, in November, 1886, and found it to be independent of all other North American families.

*Adá-i*.—A small people once living between Sabine River and Natchitoches, La., which is still remembered as belonging to the Caddo confederacy.

*Caddo* of north-western Louisiana, and the Assinai or Cenis of middle Texas, spoke dialects closely related to each other, and, with six or seven other tribes, formed a confederacy, the remnants of which now live near Washita River, on the Kiowa, Apache, and Comanche reservation, Indian Territory.

*Shetimasha*.—The few Indians of this family still live at one of their old seats, at Charenton, St. Mary's parish, La., while others are farther north on Plaquemine Bayou.

*Atákapa*.—This language seems to have had a pretty extensive area in earlier centuries, for Dr. Sibley stated in 1805 that the Karánkawa Indians of the middle Texan coast spoke Atákapa, besides their own language. At present only two dialects are known, both in south-western Louisiana.

*Karánkawa*.—A people of the Texan coast, and settled there until the middle of the nineteenth century. Of their language, only twenty-five terms are known, published in *Globus*, a geographic magazine of Braunschweig, 1886 (pp. 123-125, vol. xlii.). The classing of this language as a separate family is only provisional.

#### TOWN-MAP OF THE OLD CREEK COUNTRY.

The numerous towns marked on this map from authentic documents subdivide themselves into

towns of the Upper Creeks on Coosa and Tallapoosa rivers, and of the Lower Creeks on Chatahutchi and Flint rivers. The Koassáti and Alibamu towns lay on Alabama River, below the Coosa-Tallapoosa junction. Witímka, at the Coosa Falls, which was an Alibamu town, made an exception, being on Coosa River. On Chatahutchi River the upper towns spoke Creek; the lower ones, from Chiaha downward, spoke Hitchiti; Yuchi and its colonies on Flint River spoke Yuchi.

Many Creek towns mentioned in history could not be inserted here, because their location is not known with accuracy, like Tallipsehogy, Chunúnagi, Chatoksofki, Koha-mutki-kátska, etc. Others had to be omitted for want of space in crowded parts of the map.

The towns are described in my publication above mentioned (pp. 124-151). Names still used at present are written in capitals on the map. All names of this and the preceding map are spelled according to my phonetic system of alphabetic writing.

ALBERT S. GATSCHET.

#### Specific variations in the skeletons of vertebrates.

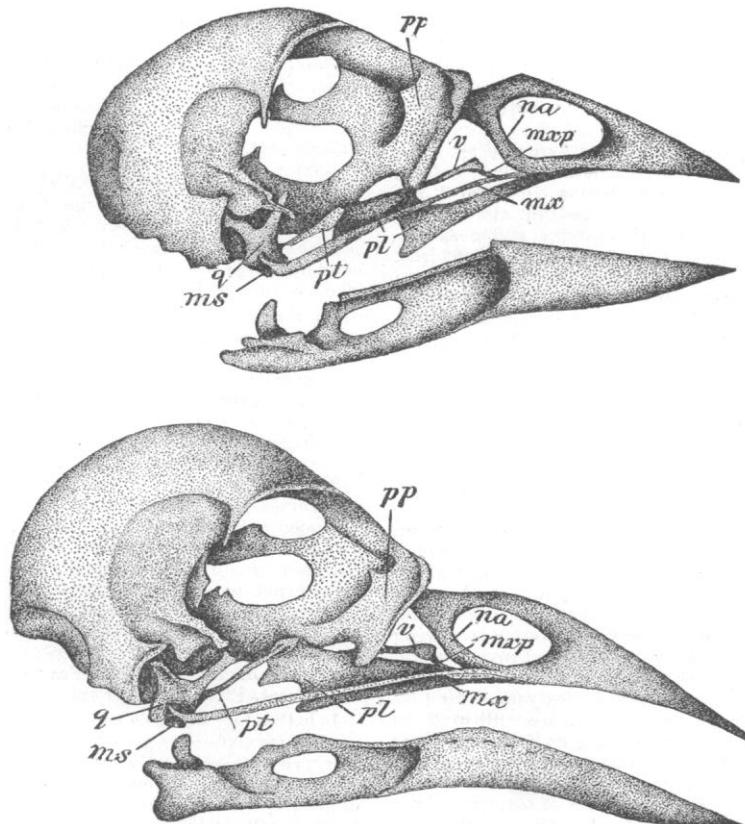
When I speak of the specific variations as they occur in the skeletons of vertebrates, I refer to those appreciable differences in form which we find to exist when we come to compare any two skeletons of the same species, or, as for that matter, a series of skeletons of the same species. As in every thing else, as we are well aware, no two skeletons, even of the same species, are exactly alike; but I have reason to believe that it is not generally appreciated how great this degree of difference may be sometimes. It has always been one of the chief drawbacks to the study of human craniology, that the skulls in *homo*, representing the same race, have frequently been found to be so thoroughly unlike, both in measurement and in general characteristics. We would come across skulls of Caucasians, with wonderfully low cranial capacities, a small facial angle, and, indeed, having perhaps many of the racial characters as they might occur in the skull of a Malay. It will be my object in the present letter to show that these differences are quite as marked among the species that go to make up the classes below man, as they are among the skeletons of the same species of men; and I will also present a number of examples chosen from the lower vertebrates to illustrate this point.

People who have given no special thought to this matter are led to believe that when they have carefully described the skeleton of any vertebrate, such a description will answer for the skeleton of that species for all time, provided specimens of the same age and habitat be chosen for comparison, and the original description was accurately recorded. Such persons have often amused me by the great stress they lay upon the numerous measurements they make, and the extraordinary pains they take to have them of hair-splitting accuracy for the skull or other parts of any skeleton they may be describing. These measurements, of course, are of very great importance, but we must bear in mind always that they are really but fractions of some standard which we should aim to eventually obtain in every case; by this I mean a standard obtained, say, by taking the

average of the measurements secured from fifty or more skulls or other parts of the skeleton. So, too, with our *descriptions* of such material, for we must remember, that, as important as the detailed account of the skeleton of any species of vertebrate may be, it will in no case exactly apply to the skeleton of another specimen of the same species, every thing else being equal.

This being the case, we should endeavor to have before us as large a series as possible of skeletons of the particular form or species we may be describing

of the skull of our violet-green swallow (*Tachycineta thalassina*). This drawing is perfect in all its details, and the subject was chosen from a series of a number of others. Notwithstanding this, fault was found with it in certain quarters, and it was said that the maxillo palatines of the specimen were broken off, whereas in reality nothing of the kind had happened, the specimen being an unusually perfect one, although in it these parts were shorter than they commonly occur. (I have since learned with regret that the person who had this fault to find, for it did not



RIGHT LATERAL VIEW OF SKULLS OF *X. XANTHOCEPHALUS* ( $\times 2$ ).  
 pp, pars plana; na, nasal; mpx, maxillo-palatine; v, vomer; mx, maxillary; pl, palatine; pt, pterygoid;  
 ms, mandibular sesamoid; q, quadrate.

with the view of giving a published account of its osteology to the world. When this is the case, it is sure to reveal its advantage in our account by the character of our description, and the weight we attach to the length of a process here, the form that a certain part may assume there, or the size, presence, or absence of vacuities and foramina, and similar details. To better illustrate my meaning, I would cite the following example: last winter I published in the *Proceedings of the Zoölogical Society of London* a contribution to the comparative morphology of the swifts, humming-birds, and goatsuckers; and among the figures in the text was a drawing of mine, twice the size of life, giving the basal aspect

constitute criticism, had not a single specimen of the species before him, or available, at the time he published his remarks!) Students of human craniology who have studied long series of skulls from individuals of the same race, will at once appreciate the point I desire to convey here; for how often do we find, say, in one skull, a styloid process, for example, perhaps an inch or more in length, whereas in another specimen from the same series it will be represented by the most insignificant apophysis imaginable!

For a number of years past I have been collecting material to illustrate the very point about which I am now writing; and among this material I find

long series, amounting to fifty or more in some cases, of skulls of such forms as our western meadow-lark (*S. M. negleata*), or our red-winged and yellow-headed blackbirds (*A. phoeniceus* and *X. xanthocephalus*). It will be impossible to detail here the differences which are to be found in these highly instructive series, as they occur for the several respective species mentioned; but I herewith present drawings which I have made ( $\times 2$ ) of two skulls chosen from a series of skulls of our yellow-headed blackbird (*X. xanthocephalus*) to illustrate the point under consideration. One of these I collected at Fort Wingate here, last July (1886), and the other in Wyoming in 1879. The former is the upper figure, and the lower the latter; and a glance at them will be sufficient to convince us of the extraordinary differences that obtain between them, both as regards measurements and the general form of their several parts. Similar differences are to be found in the other species alluded to above: indeed, they hold good for the skeletons throughout the vertebrate series. No less marked variations are to be found, when we come to examine sufficient material, in the sternum of the same species of birds. I have already pointed this out for the American vultures in my 'Contributions to the anatomy of birds,' published several years ago, and extracted from Hayden's 'Twelfth annual' (p. 771), wherein we find some striking differences in this bone, more especially in its xiphoidal extremity. My collection also affords examples of similar variations in the pelvis of birds of the same species; and I have two pelvis before me of *X. xanthocephalus*, wherein in one the ilia meet on either side for a considerable distance the neural crista of the dorso-lumbar vertebrae, while in the other the reverse condition obtains, and they are separated from that median plate of bone, on either side, by a very decided interval. But space here will not admit of further citing interesting examples of these variations; nor is it necessary, for, in the light of those already presented, the entire ground may be covered by saying that in all forms, both vertebrate and invertebrate, paleontological and otherwise, when we come to compare sufficiently extensive series represented by individuals of the same species, we will find in similar structures marked variations both as regards relative size and form as we pass from one specimen to another, and if extremes be chosen the differences will be found to be in many cases of a very striking nature.

R. W. SHUFELDT.

Fort Wingate, N. Mex., April 15.

**International congress of geologists.—American committee meeting at Albany.**

At a meeting of the American committee (elected by the standing committee of the American association for the advancement of science to represent American geology in the International congress of geologists) held in Albany on April 6, there were present Prof. James Hall (president), Professors Hitchcock, Stevenson, Williams, Winchell, Cook, Cope, and Frazer (secretary). Professors Emerson, Smock, and Clarke, Dr. Rominger, and Mr. Beecher were invited to be present at the sessions of the committee. By unanimous vote, Mr. W. J. McGee was invited to take the place, during the meeting, of Major Powell, who was prevented by sickness from attending.

The secretary announced that there had been forty-five subscribers for fifty copies of the geological map of Europe.

A motion was adopted, abolishing the committee of the whole and its officers, and intrusting the duty of preparing reports on the separate divisions of the geological column to eight 'reporters,' who were thereupon unanimously elected (see circular letter to geologists, below).

The following was adopted by the committee:—

*Resolved*, that we recommend to American geologists the acceptance of the conclusions of the International congress; said changes to be formulated at a subsequent meeting of the committee; and it being understood that the committee will present such additions as are deemed necessary by American geologists, to the Congress of London in 1888.

PERSIFOR FRAZER, *Secretary.*

Philadelphia, April 22.

[To all American geologists.]

At the recent meeting of the American committee in Albany, 'reporters' were elected whose duty is to prepare reports on the several parts into which, for convenience, the geological column has been divided. The assignment is as follows:—

Quaternary, recent, and archeology, Major Powell, director U. S. geological survey, Washington, D.C.

Cainozoic (marine), Prof. E. A. Smith, state geologist, University of Alabama, Tuscaloosa county, Ala.

Cainozoic (interior), Prof. E. D. Cope, 2102 Pine Street, Philadelphia, Penn.

Mesozoic. Prof. G. H. Cook, state geologist, Rutgers college, New Brunswick, N.J.

Upper paleozoic (carbonic), Prof. J. J. Stevenson, University of the city of New York.

Upper paleozoic (Devonic), Prof. H. S. Williams, Cornell university, Ithaca, N.Y.

Lower paleozoic, Prof. N. H. Winchell, state geologist, University of Minnesota, Minneapolis, Minn.

Archaeon, Dr. Persifor Frazer, 201 South 5th Street, Philadelphia, Penn.

It is the duty of these reporters to obtain as complete information as possible, each for his own subject, from American geologists interested in it; but, on account of the difficulty of ascertaining the names of all who have information to impart on a particular topic, it will not be possible to address letters to more than a few of those who are known to have studied a subject. For this reason each of the undersigned appeals to all his professional brethren for aid in preparing the report which is intrusted to him. It is not possible that any single scheme will be approved by all geologists, and therefore it is the more necessary that there should be a fair statement of any opposing views in each report. These reports will be submitted to criticism and discussion at the next meeting of the American committee, to be held probably next August; and an effort is being made to have them discussed formally in Section E at the meeting of the American association for the advancement of science, to be held afterwards. With such advantages for knowing the views of our countrymen, there seems every prospect that the American representation at the next congress will exercise an influence proportional to the importance of its constituency.